

FAA William J. Hughes Technical Center

Human Factors Acquisition Support Research and Development Human Factors Laboratory

The Human Factors Acquisition Support team works directly with the Air Traffic Services and the integrated product teams to address human factors concerns and apply human factors principles and practices throughout the system development and acquisition process.

The program emphasizes objective risk mitigation research activities at key points during the development and acquisition process. The goal is to improve the quality, effectiveness, safety, and user acceptance of FAA systems. The following are recent examples of these activities.

Standard Terminal Automation Replacement System (STARS)

A multidisciplinary team lead by ACT-530 conducted usability assessments, rapid prototyping, and computer-human interface (CHI) validation studies during the development of the initial and more advanced designs for the STARS Terminal Controller Workstation (TCW). The design changes resulting from these activities improved system usability and user acceptance. The Early Display Configuration has now been fielded at two sites. Human factors researchers also conducted evaluations of advanced display technologies and CHI issues for displaying radar information in air traffic control towers, which must be consistent with the TCW but readable under varying light conditions. Finally, ACT-530 used the Virtual Environments laboratory to support the STARS Transition and Implementation group to address human factors concerns about the facility design, equipment layout, and transition to the new system.

Host and Oceanic Computer System Replacement (HOCSR)

During Phase 1, ACT-530 human factors researchers conducted usability and ergonomic assessments of the new enroute G3 computer system, hardware management console, and the S/IR communication subsystem. During Phase 2, they conducted a human factors evaluation of the software upgrade and related changes to message syntax and the configuration summary. Finally, they conducted initial analyses and provided human factors criteria for the acquisition of system peripherals (e.g., printers, display monitors) during Phases 3 and 4.

Automated Flight Service Station (AFSS)

Human factors researchers have supported several aspects of system acquisition for AFSSs. The initial effort provided human factors specifications for new workstation consoles to support new automation equipment. They then conducted evaluations of vendor products and made recommendations on which had the best human factors characteristics. During the evaluations, they also did an assessment of different keyboards and pointing devices and made recommendations for selection. The design of the CHI for the new software tools was a second effort. One aspect was the design of the tools for flight plan entry into the national airspace computer system. The second aspect was developing prototypes of weather graphics used for briefing pilots about conditions on their route of flight. Researchers also developed human-centered prototypes for an AFSS touch-entry voice communication switch.

The Acquisition Support team has conducted human factors efforts on numerous other systems, including the STARS Monitor and Control Workstation, enroute Display System Replacement, enroute supervisors workstation, flight strip printers, digital voice



communication system, Airport Movement Area Safety System, Standalone Weather System, National Infrastructure Management System, Cockpit Display of Traffic Information, and the Controller-Pilot Data Link Communication system. They are currently working on the development and integration of preplanned product improvements (i.e., enhancements to the basic air traffic control systems) and the development of new airport surface detection equipment displays.

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System Efficiency